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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/817,047	04/02/2004	Isaac Farr	200313424-1	2217

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FORT COLLINS, CO 80527-2400

EXAMINER
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SASTRI, SATYA B

ART UNIT	PAPER NUMBER
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1713

DATE MAILED: 04/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/817,047

Applicant(s)

FARR ET AL.

Examiner

Satya B. Sastri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 02 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/2/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_.

### DETAILED ACTION

1. This office action is in response to application filed on April 4, 2004. *Claims 1-28* are now pending in the application.

#### *Election of Species Requirement*

2. This application contains claims directed to the following genera of patentably distinct species of the claimed invention: basic component, acidic component, acrylate, oxidizing agent, reducing agent, binder, viscosity modifier and surface tension modifier.

Applicant is required under 35 U.S.C. § 121 to elect a **single ultimate** disclosed specie for each of the above genera for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Where specific species are not identified in the claims applicant should elect a specific specie from the specification. An alternative method of election is to identify an example which collectively exemplifies the elected species. Currently, claims 1-28 are generic.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

Should applicant traverse on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to

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be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Conclusion to Election of Species Requirement***

3. During a telephone conversation with Mr. Bradley Hamond on February 17, 2006, a provisional election was made with traverse to prosecute the invention of claims 1-28 with the following elected species: reactive glasses as basic component, polyacrylic acid as acidic component, difunctional acrylate as acrylate, benzoyl peroxide as oxidizing agent, water soluble amine as reducing agent, water as binder, ethanol as viscosity modifier and fluoro surfactant as surface tension modifier. ***Claims 1-26*** read on the elected species and ***claims 27, 28*** are withdrawn from further consideration as being drawn to a nonelected invention. Affirmation of this election must be made by applicant in replying to this Office action.

### ***Specification***

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4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Compositions for solid freeform fabrication.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. ***Claims 1-26*** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wada et al. (US 6,583,197 B1).

Prior art to Wada et al. discloses a dental adhesive comprising 100 parts of a polymerizable unsaturated monomer containing 5% by wt. or more of a radical polymerizable monomer having an acid group, 35 to 100 parts of an acid reactive filler, 35 to 100 parts of water and 5 to 100 parts of water-soluble organic solvent and 0.1 to 10 parts by wt. of a polymerization catalyst (abstract).

A variety of (meth)acrylic monomers including (meth)acrylic acid (col. 3. Lines 45-67) are disclosed in the prior art. It is noted that the instant specification includes methacrylic acid as an acrylate component (paragraph 0058, PGPUB). Additionally, **an acid reactive filler** based on metal oxide, metal salt or an **acid reactive glass** such as fluoroaluminosilicate is disclosed

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(column 4, lines 23-50). A water soluble organic solvent is included to improve the solubility of the polymerizable monomer in water and includes **ethanol**, propanol, methyl butanol with ethanol and isopropanol as preferred solvents (column 6, lines 30-47). The prior art also discloses that in addition to the acid based monomer, other acrylates and **dimethacrylates** may be used either alone or as a combination with dimethacrylates as particularly preferred species (col. 6, lines 58-67 and col. 7, lines 1-32). Disclosed initiators and promoters are those based on radical polymerization initiators, for redox polymerization and photopolymerization (col. 7, lines 32-39). Organic peroxides such as **benzoyl peroxide** and t-butyl hydroperoxide and reducing agents based on **amines** are disclosed (col. 8, lines 5-25). The compositions may further include fillers such as fused silica, quartz glass, **organic fillers** etc. (column 9, lines 16-30). A surfactant may be used for improving the compatibility for a fluid (column 9, lines 36-54). In a typical case liquid A contains **water**, an acid reactive filler, a water miscible solvent and a polymerization catalyst and liquid B contains radical polymerizable monomer, a water soluble solvent and a polymerization catalyst (column 10, lines 6-24).

The difference between the prior art and the instant invention is that the prior art does not teach a fluorosurfactant in the compositions.

The primary reference teaches a variety of generic surfactants useful in the ionomeric cement compositions. However, given that fluoroaluminosilicate based glasses are preferred fillers in the compositions, it is the examiner's position that it would have been obvious to a skilled artisan that a fluorosurfactant would better serve to disperse a fluorine-containing glass filler component in an aqueous binder. Thus, it would have been obvious to one of ordinary skill

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in the art at the time the invention was made to include a fluorosurfactant in the ionomer compositions disclosed by Wada et al. and thereby obtain the instant invention.

7. **Claims 1-26** are rejected under 35 U.S.C. 103(a) as being unpatentable over Akahane et al. (US 5,063,257) in view of Wada et al. (US 6,583,197 B1).

Akahane et al. disclose dental glass ionomer cement comprising 5 to 100 parts of a polyacid component, 5 to 100 parts by wt. of fluoroaluminosilicate capable of reacting with polyacid, (c) 5 to 100 parts by wt. of polymerizable acrylate, (d) 0.01 to 5 parts by wt. of a polymerization catalyst, (e) 2 to 50 parts by wt. of water, (f) 0.01 to 20 parts by wt. of a surface active agent and (g) 0.01 to 5 parts by wt. of reducing agent and optionally (h) 0 to 50 parts by wt. of an inorganic filler (abstract). Particularly preferred (a) are homo or copolymers of acrylic or maleic acid (column 3, lines 45-47). Polymerizable acrylate includes a variety of diacrylate and dimethacrylate compounds (column 5, lines 58-69, column 6, column 7, lines 34-36). Additionally, the composition may use redox or photopolymerization initiators in amounts of 0.01 to 5 parts and amine based reducing agents in amounts of 0.01 to 5 parts by wt. The ionomer cement may optionally contain organic peroxides, UV absorbents, inhibitors etc. (column 7, lines 50-69, column 8, lines 1-30). A variety of surface active agents are disclosed in column 8, lines 50-69, column 9, lines 1-14). Furthermore, the cement may be formulated in a variety of ways, as a powder/liquid, paste/liquid or paste/paste (column 9, lines 50-69, column 10, lines 1-11).

The difference between the prior art and the instant invention is that the prior art does not teach ethanol as viscosity modifier and a fluorosurfactant in the compositions.

The secondary reference is in an analogous field and discloses water soluble solvents such as methanol, ethanol and propanol to improve the solubility of polymerizable monomer in the composition and to improve the homogeneity and adhesion performance (column 6, lines 30-47). Thus, it would have been obvious to one skilled in the art at the time the invention was made to include solvents such as ethanol and propanol in the composition of Akahane et al. and thereby obtain the instant invention.

The primary teaches the use of redox or photopolymerization initiators in amounts of 0.01 to 5 parts and amine based reducing agents in amounts of 0.01 to 5 parts by wt. The secondary reference to Wada et al. discloses benzoyl peroxide as oxidizing agent and water soluble amines as reducing agent (column 8, lines 5-25).

With regard fluorosurfactant, the primary reference teaches only generic surfactant. However, given that fluoroaluminosilicate based glasses are used as the filler, it is the examiner's position that it would have been obvious to a skilled artisan that a fluorosurfactant would better serve to disperse a fluorine-containing glass filler component in an aqueous binder.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satya Sastri at (571) 272 1112.

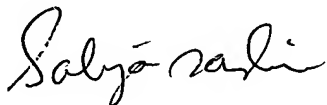
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached at (571) 272 1114.



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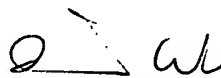
The fax phone number for the organization where this application or proceeding is assigned is (571) 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SATYA SASTRI

April 3, 2006



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ADVISORY PATENT EXAMINER  
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